第二言語習得と意味理解における聴覚インプット強化の効果

The Effect of Aural Input Enhancement on Second Language Form Acquisition and Meaning Comprehension

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ABSTRACT

聴覚インプット強化（AIE）とは，音量・速度変化等インプットを外的に操作することにより目標言語形式に対し学習者の注意を促す介入方法である。先行研究により，教師は学習者に対し速度変化等の発話修正を行うことが明らかとなったが（Chaudron, 1988），AIEという枠組みの中，その学習効果を検証する研究は限られている。本研究では日本人中学生英語学習者を対象に，新出形式の産出及び受容能力の発達と意味理解におけるAIEの効果を検証した。参加者は実験群と統制群に分けられ，実験群のみAIEが施された音声を聴いた。空欄補充テスト及び文法性判断テストの結果，両群間に有意差は認められず，産出及び受容能力発達におけるAIEの学習効果は顕著に見られなかった。また，AIEが意味理解に支障をきたさないことが示された。質問紙によりAIEに対する学習者の気づきに差があることが明らかとなったことから，学習者の気づきレベルを考慮した上でAIEの学習効果を検討する必要性が示唆された。

The current quasi-experimental study aims to explore the role of aural input enhancement (AIE) on second language (L2) form acquisition by Japanese English as a foreign language students. Previous studies have found that speech modifications are frequently employed by L2 instructors (Chaudron, 1988), yet little

research has investigated effects of AIE for L2 development. To address the gaps in the previous studies, this study investigated to what degree AIE facilitates L2 learners to develop productive and receptive skills of a newly introduced form, and whether AIE obstructs learners' comprehension of meaning. A total of 43 Japanese junior high school students were assigned in either experimental or control groups and participated in a series of classroom sessions. During the treatment, only the experimental group listened to an audio recording with AIE added on the target form, the present hypothetical conditional in English. The effect of AIE for L2 development was quantitatively analyzed utilizing a pretest, an immediate-posttest, and a delayed-posttest. Additionally, participants' comprehension was measured with a timed multiple-choice test. Results of the study suggest that there was no effect of AIE on participants' immediate learning and retention of the production and receptive skills of the target form. In addition, the analysis of the multiple-choice comprehension test showed no detrimental effect of AIE on meaning comprehension. Following experimental group's reports on different noticing experience towards AIE, this study implies the importance of considering the levels of noticing experience held by learners to further examine the effects of AIE in L2 development.

1. Introduction

Input enhancement is a pedagogical intervention whose purpose is to direct learners' attention to particular linguistic items in input by manipulating them to enhance saliency (Sharwood-Smith, 1993). The premise underlying here is that attention facilitates linguistic items in input to become intake: Tomlin and Villa (1994) argue that detection, the highest level of attention, is required for second language acquisition (SLA) because it helps linguistic items to be registered in memory and can be available for future learning of hypothesis formation and testing. Schmidt (1995, 2010) also emphasizes in his Noticing Hypothesis that "learners must attend to and notice linguistic features of the input that they are exposed to if those forms are to become intake for learning" (Schmidt, 2010, p. 3). Despite its essential feature, attention is limited in capacity, thus second language (L2) learners can direct attentional resources to the items with low communicative value in input (i.e., forms) only after they become capable of processing communicative content at no cost or little cost to attentional resources (VanPatten, 1996). That is, although attention to forms facilitates input to become one's linguistic knowledge (Gass, 1997; Schmidt, 1995, 2010; Tomlin & Villa, 1994), learners with limited proficiency of L2 are less likely to attend to forms all by themselves. As a way to ease L2 learners to attend to linguistic items and to benefit from the facilitative role of attention, input enhancement has captured SLA researchers' interests (Izumi, 2002).

Input enhancement can be implemented both in writing and aurally. Examples of written input enhancement are the use of typological cues on particular linguistic items on texts, such as boldfacing, capitalizing, color coding, italicizing, underlining, or enlarging font size. Aural input enhancement (AIE), on the other hand, includes changing speech speed and increasing volume of linguistic items in speech, or inserting pauses before and after the linguistic items (Sharwood-Smith, 1993). While a number of researchers have given much attention to examine effects of written input enhancement for L2 form acquisition (e.g., Jourdeneais, Ota, Stauffer, Boyson, & Doughty, 1995; Lee, 2007; Leow, 2001), only a few studies have investigated AIE (Cho & Reinders, 2013; Lee & Lee, 2015; Zanjan, 2017) and little is known about its role for L2 form development. Because

previous studies have found that input processing and attentional distribution differ between visual and aural modes (Anderson, 1980; Rost, 1990; Wong, 2001), and speech modifications are frequently employed by L2 instructors in real L2 classrooms (Chaudron, 1982, 1988), it is of value to further explore effect of AIE on L2 form acquisition.

2. Literature Review

2.1 Empirical Research on Input Enhancement

In line with the trends of attention and noticing for SLA as well as the limited capacity of attentional resources, a number of studies have investigated roles of input enhancement that are textually manipulated. These studies examined whether written input enhancement, such as boldfacing and italicizing, helps L2 learners raise attention to forms in input and facilitates L2 form acquisition, as well as whether written input enhancement prevents learners' comprehension of meaning (e.g., Jourdeneais et al., 1995; LaBrozzi, 2014; Lee, 2007; Leow, 2001; Leow, Egi, Nuevo, & Tsai, 2003; Wong, 2003). While many studies revealed that written input enhancement does not impede comprehension of meaning, findings on the effects of written input enhancement on L2 form acquisition are inconclusive: Some revealed positive effects of written input enhancement on L2 form acquisition (e.g., Jourdenais et al., 1995; LaBrozzi, 2014; Lee, 2007), whereas others found no effects of written input enhancement for the acquisition (e.g., Leow, 2001, Leow et al., 2003; Wong, 2003). In response to these mixed results, Lee and Huang (2008) conducted a meta-analysis of 16 primary research on written input enhancement for L2 form acquisition. The analysis revealed that there were slightly more positive effects of enhanced texts than unenhanced texts with regard to L2 form acquisition ($d = 0.22$).

While a number of research has examined written input enhancement, only a few studies have been conducted to investigate the effects of AIE on L2 form acquisition (Cho & Reinders, 2013; Lee & Lee, 2015; Zanjan, 2017), regardless of the fact that input enhancement can be implemented both visually and aurally. Yet, these studies varied in methodologies and contained methodological issues, which may have resulted in inconclusive findings among these studies.

2.1.1 Lee and Lee (2015)

In a comparative study on the effect of written input enhancement and AIE, the study investigated whether slowing down playback speed plus increasing volume of an audio at a target form, English future perfect tense, facilitated Korean high school students to acquire the form. A day after participants had completed a written multiple-choice test and a written error correction task as a pretest, a treatment and an immediate-posttest were administered. During the treatment, an aural group listened to a five-minute audio recording with AIE on six correct exemplars, while a visual group read the same text with written input enhancement on the exemplars for five minutes. Delayed-posttest was administered 20 days later. A paired *t*-test revealed that although both groups significantly improved from the pretest to the delayed-posttest, the aural group outperformed the visual group. Lee and Lee (2015) highlighted that the aural group's greater retention of the form may resulted from time-pressed input flux of audio language: AIE made the students pay more intense attention during the listening, and helped them hold the enhanced target form tightly in their working memory and then processed it to long-term memory. Furthermore, an analysis of a picture-sequencing comprehension test demonstrated no detrimental effect on the participants'

comprehension of the meaning by the AIE. Nevertheless, a careful analysis is needed to comprehend these findings. As Lee and Lee (2015) suggested, the control group did not participate in the treatment session, which made it difficult to clearly isolate the effect of AIE on the development of the target form.

2.1.2 Zanjan (2017)

Zanjan (2017) also compared effect of written input enhancement and AIE on acquisition of the English present continuous and conjugation of the verb "have" in present tense (have vs. has). A total of 60 high school students were randomly assigned to either the written input enhancement group (n = 30) or the AIE group (n = 30). Learning of the target forms were measured through the Oxford placement tests administered before and immediately after treatment sessions where the participants either read or listened to a short test with written input enhancement (i.e., italicizing or bold-facing) or AIE (i.e., adding stress on the target form). The statistical analysis using independent t-tests indicated that both groups successfully developed the target form after the treatment. Yet, there were a couple of methodological issues: the study did not include a control group, and it only analyzed participants' immediate learning because no delayed-posttest was conducted.

2.1.3 Cho and Reinders (2013)

In contrast to the previous two studies, findings by Cho and Reinders (2013) suggested that AIE does not facilitate L2 form acquisition. The study examined effects of AIE on Korean college English as a foreign language (EFL) learners' acquisition of English passive voice. This time, the participants were randomly assigned to one of the three groups: two experimental groups and a control group. As a weekly homework, the participants listened to a 90-minute audiobook with the target form manipulated by adding pauses (the experimental group 1), by slowing down the playback speed (the experimental group 2), or without any manipulations (the control group). One week after they had taken a grammaticality judgment test as a pretest and received the audiobook, they completed another judgment test as a posttest. Findings suggested no beneficial role of AIE on the development of the target form. Cho and Reinders (2013) argued that the results may be attributed to the learners' failure to reach the point of noticing that was sufficient to formulate underlying rules in input, partly because of the high cognitive demands by processing both meaning and form simultaneously in aural mode. Yet, there existed some methodological issues. Questionnaires revealed that treatment was not implemented in the same way among the participants because they were asked to listen to the audio recording as homework. Furthermore, the implementation of the treatment as a weekly homework created differences at the interval from the time the participants finished listening to the audio recording to the time they completed the posttest.

As presented above, only a few studies have investigated the effects of AIE for SLA compared to the research on written input enhancement. Because the previous studies on AIE represented inconsistent results and there is a high possibility that the methodological issues affected the findings of the studies, further research should be conducted using more rigorous methodology to explore the effect of AIE.

2.2 Influence of Modality in Input Processing and Attentional Distribution

The importance of conducting further studies on AIE stems from differences of input processing between written and aural modes. Because the ways of input processing and attentional distribution differ across modalities, findings

reported on the studies on written input enhancement may not necessarily be obtained from AIE.

Previous research has reported that processing of aural input is more difficult and demanding than processing of written input. Research on effects of modality on grammaticality judgement has found that adult L2 learners who had received tasks aurally were less accurate than those who had received tasks in text (Johnson, 1992; Murphy, 1997). In addition to reduced accuracy, research also revealed that aural processing took longer time than visual processing for grammaticality judgments (Murphy, 1997). Furthermore, findings of the study on the relationship between modality and attention demonstrated that modalities influenced the amount of L2 learners' attentional resources that were consumed to attend to meaning and form: Wong (2001) found that input processing through aural mode required more attentional resources than input processing through written mode to direct one's attention to meaning and form. Therefore, modality is a crucial variable that influences the ways L2 learners process input and distribute attentional resources.

The increased difficulty of information processing and attention distribution in aural mode lie in differences between written and audio languages. It has been said that written and audio languages vary in terms of permanence of information, freedom of access, and ways of decoding information (Anderson, 1980; Brown & Lee, 2015; Rost, 1990). Written language is permanent because information is printed on materials. This permanence gives readers controls over access to information, allowing them to decide the amount of information processed and the rate of processing (Brown & Lee, 2015). Furthermore, readers can decode input without much effort because input on written texts is shown to be segmented into words, sentences, or paragraphs (Rost, 1990). In contrast, because of the fleeting feature of audio language, information is not continually available to listeners and they do not have freedom of access to the information (Brown & Lee, 2015): Aural language does not allow listeners to go back and process information once they have missed, unless they ask speakers to repeat the information. Furthermore, audio language requires listeners to segment and decode input simultaneously (Anderson, 1980; Rost, 1990). Unlike written language which represents segments, listeners must segment speech into units on their own with reference to temporal pauses, intonation rises and falls, stress placements, and rhythmic groupings. Hence, more effort and attentional resources are required when learners process information in aural mode than in visual mode. Under the greater processing demands in aural mode, it is of importance to investigate whether AIE assists learners to attend to form and facilitates L2 form development, without impeding meaning comprehension.

2.3 Speech Modifications in Language Classrooms

Another important reason for investigating AIE arises from language teachers' frequent uses of speech modifications during their interactions with L2 learners in real classroom contexts. Early SLA studies examined the way language teachers talk to non-native speaking students compared to the way they talk to native speaking students (Chaudron, 1988). Findings of these studies demonstrated that teachers were likely to adjust their speech to non-native speaking learners for the purpose of conveying information better and maintaining interactions with the learners (Chaudron, 1988). Among the different linguistic features, a lot of research examined adjustments in the area of phonology, such as rate of teachers' speech, pauses, articulation and stress. Regarding the rate of

speech, findings indicated that teachers' speech was likely to become slower when interacting with non-native speaking students (Håkansson, 1987; Wesche & Ready, 1985). Others discovered that teachers have a tendency to add pauses to specific words in order to aid non-native speaking students' information processing (Chaudron, 1982; Henzl, 1973). Furthermore, studies observed that teachers marked stress when they talked to non-native speakers for the purpose of emphasizing and making students pay attention to specific items in teachers' speech (Chaudron, 1982; Henzl, 1973). These studies demonstrated that teachers often make phonological adjustments to their speech in real contexts to assist information processing in L2. Although the frequent use of speech modifications in classrooms has been documented in these previous studies, little has been understood to what extent oral input enhancement benefits L2 learning.

2.4 Rationales and Research Questions for the Present Study

Regardless of the modality differences in information processing and distribution of attention as well as the high frequency of phonological adjustments made by teachers in language classrooms, only a few studies have investigated effects of AIE for SLA. Furthermore, as described in 2.1, the previous studies on AIE represented inconsistent results. Because the previous studies contained methodological issues, it is of value to conduct further classroom research with rigorous methodology to explore the role of AIE for SLA. In order to address the gaps in the previous studies, this study attempts to answer the following three questions:

(1) Does AIE facilitate EFL learners to develop their production skills of the English hypothetical conditional?
(2) Does AIE facilitate EFL learners to develop their receptive skills of the English hypothetical conditional?
(3) Does AIE obstruct learners' comprehension of meaning while they are listening to the audio recording?

3. Method

The current study consisted of a total of three classroom sessions using a pretest, immediate-posttest, delayed-posttest design. Data collection was conducted at a private junior high school in Japan over the course of 20 days. All participants gave informed consent to participate in the study.

3.1 Participants

The original pool consisted of a total of 57 Japanese learners of English as a foreign language whose proficiency levels were lower intermediate to intermediate. They were from two intact classes in their second year at a private girls-only junior high school in Japan (Class A and Class B). Nine of the 57 students were excluded from the study because they did not complete all three sessions. In addition, five students were excluded from the study, because they ended up three standard deviations away from the mean of an independent category. As a result, a total of 43 students were the participants of the study. They were randomly assigned to either the experimental group (n = 25) in which participants listened to an audio recording with AIE, or the control group (n = 18) in which participants did not receive any enhancement while listening to the audio recording.

3.2 Target form

The English present hypothetical conditional, which is used when one makes a wish or an assumption that will never be happened in reality (Murphy & Smalzer, 2009), was the target form of the present study (e.g., *If I had a car, I would see my friend*). The present hypothetical conditional

had not yet been introduced in the junior high school's regular English classes by the time of the study, thus it was regarded as a newly introduced form for the participants. The present study selected the newly introduced form as the target form in an attempt to reduce the effect of participants' level of proficiency and previous knowledge on findings of the study.

3.3 Materials

3.3.1 Audio Recording with AIE

A one-and-a-half-minute audio recording was prepared for the treatment session. Prior to the treatment session, two native speakers of American English recorded a dialogue. The target form appeared in the dialogue four times in total: Three times in declarative sentences and once in a question. Two of the four sentences included a conditional *would* and the other two sentences included *could* and *might* for each in main clauses. Other than the target form, all grammar and vocabulary items that appeared in the dialogue had already been introduced to the participants in regular English classes at the school.

The audio recording used for the experimental group was then digitally manipulated by using a sound editing software called Audacity. In Cho and Reinders (2013), pauses for 1.5 seconds were added before and after the target form, and this enhancement was noticed by most of the participants. Nevertheless, Cho and Reinders (2013) argued that a single enhancement by inserting the pauses seemed too little a change to lead the participants to be consciously aware of the enhancement. Therefore, a combination of the following two types of manipulations was added to the target form on the recording in this study: (1) insertions of pauses for 0.2 seconds before and after the past tense verbs and the auxiliary verbs in if clauses and main clauses, and (2) volume increases at the past tense verbs and the auxiliary verbs.

3.3.2 Short Video on the Target Form

A five-minute PowerPoint slide video with recorded aural explanations in their first language (Japanese) was created to provide an explicit explanation about the target form during the treatment session. The PowerPoint slide video included a review of the English conditional type I (e.g., *If it rains tomorrow, let's play tennis.*) that had already been introduced in regular classes before the present study, and a detailed explanation about the target form both syntactically and semantically.

3.4 Assessment Measures

3.4.1 Fill-in-the-Blank Production Test

Written, fill-in-the blank tests were developed to measure participants' developments in production skills of the target form (See Appendix A). The different sets of questions were listed on the pretest, the immediate-posttest, and the delayed-posttest. Each test consisted of 15 questions with a blank(s) at the place(s) of verbs in each question sentence, with 10 targeted form items and five distractor items. The participants were told to conjugate verbs and/or auxiliary verbs that were provided on the answer sheet in their root forms if they felt to do so. With regard to the target form, the use of a verb in simple past form in an if clause (e.g., *If Paul* ***got*** *a time machine,*) and the use of an auxiliary verb in past form followed by a verb in bare infinitive in a main clause (e.g., *he* ***would go*** *to the future.*) were regarded as correct forms. One point was awarded if the participants filled in the blanks with words in correct forms, and zero points were awarded if they failed to do so. As the 10 targeted form items consisted of two blanks each (one blank in both if clause and main clause), the total maximum score for the targeted items was 20.

3.4.2 Aural Grammaticality Judgment Test

Timed aural grammaticality judgment tests (GJT) were employed to investigate the effects of AIE on the participants' developments in receptive skills of the target form (See Appendix B). The participants were told to provide judgments of grammatical acceptability for the sentences that they had heard without any visual aids. Different items yet including similar syntactic and semantic complexities were created for the pretest and the two posttests, and each lasted for approximately nine minutes. Each test consisted of 20 targeted form items and 10 distractor items, and half of them were grammatical sentences. With regard to the ungrammatical sentences, all ungrammaticalities occurred at verb forms (e.g., *If I am* a bird, I can* fly*). As the aural grammaticality judgment task requires greater control by test-takers (Renou, 2001), the researcher had instructed participants before the tests that they needed to focus on verb forms in each sentence. Each question sentence was spoken twice, and a four-second pause was given to make grammaticality judgments, either correct or incorrect. One point was awarded for each correct judgment and zero points were awarded for each wrong judgment. The total maximum score of the aural GJT was 30.

3.4.3 Comprehension Test

Following Leow et al. (2003), a timed multiple-choice comprehension test was utilized to investigate whether AIE negatively affected learners' meaning comprehension of the audio recording (See Appendix C). The test was composed of five questions about the dialogue. Of the five questions, three asked about comprehension of the sentences which involved the AIE. The questions and choices were printed on the test sheets in participants' first language (Japanese). The participants were told to choose one of the four choices in 10 seconds. One point was awarded if the participants chose a correct choice.

3.5 Questionnaire on Audio Recording

A questionnaire on the audio recording was administered only to the experimental group students in order to probe how much attention had been directed to the AIE and the target form. The questionnaire included following five questions: (1) how difficult the audio recording was, (2) whether or not the students had noticed any enhancements on the recording, and if so, (3) when they noticed these enhancements (i.e., during the first, second, or third plays), (4) where and what kind of enhancements were added on the recording, and lastly, (5) why they think the enhancements were added on the audio recording. A Likert scale with five points (very difficult, difficult, fare, easy, and very easy) was utilized for the first question. The second and the third questions were multiple-choice questions, and the fourth and the fifth questions were open-ended questions.

3.6 Procedure

The study consisted of a total of three classroom sessions which were conducted within regular English lessons at the junior high school: Session 1 and Session 3 were administered during the first half of the two regular English lessons (25-30 minutes), and Session 2 was operationalized during a whole, regular 50-minute English lesson.

On Day 1, the experimental group and the control group participated in the first session in a same classroom. Brief instructions for the first session and the tests were provided in participants' first language (Japanese) before the actual tests began (See Figure 1). Then, the participants were asked to answer the fill-in-the-blank test and the aural GJT successively. Note that the aural GJT was preceded by the fill-in-the-blank test to avoid any potential influence of additional input on

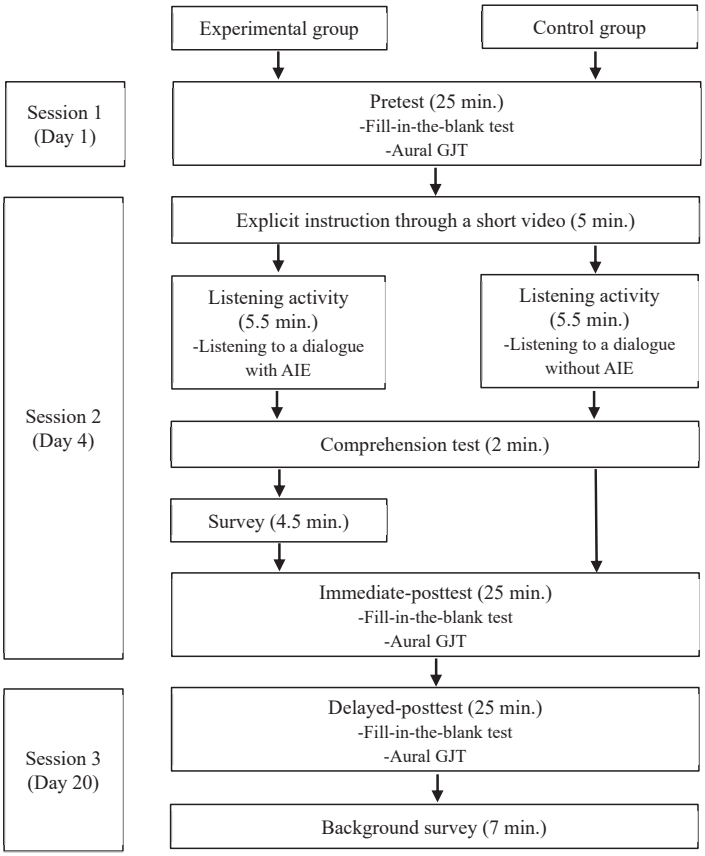

Figure 1. Study design.

learner performance at the fill-in-the-blank test. Session 2 was carried out three days after Session 1 (Day 4). This time, the experimental group and the control group were seated in different classrooms. At the beginning of the session, a brief instruction of the target form was provided through a timed video on screens for five minutes. While watching the video, the participants were not allowed to take any notes. After the explicit instruction, the participants completed the listening activity in which they listened to the audio recording of the dialogue with or without enhancements and answered the multiple-choice comprehension test. The audio recording was played three times in succession so that the participants were exposed to 12 correct exemplars. This time, the participants were allowed to take notes. After completing the comprehension test, both groups answered the fill-in-the-blank test and the aural GJT. Before moving on to the fill-in-the-blank test, only the experimental group was instructed to complete the questionnaire on AIE. Session 3 was administered 17 days after Session 2 (Day 20), and both groups completed the session in the same classroom. The participants were asked to answer the fill-in-the-blank test and then the aural GJT. After that, they received seven minutes to answer the background survey.

Table 1 *Descriptive statistics for the accuracy scores of the fill-in-the-blank test*

Test time	Groups	*N*	*M*	*SD*
Pretest	Experimental	25	0.200	0.577
	Control	18	0.222	0.647
Immediate-posttest	Experimental	25	16.440	5.910
	Control	18	17.556	4.105
Delayed-posttest	Experimental	25	7.520	6.035
	Control	18	6.056	6.421

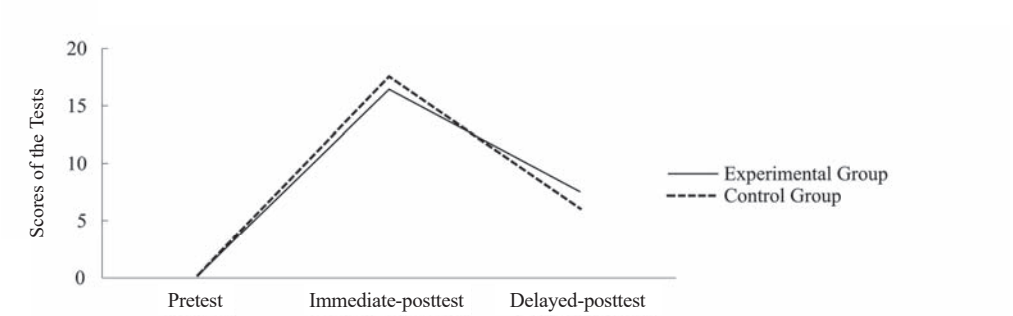

Figure 2. Expected marginal means of the scores on the fill-in-the-blank test.

Table 2 *Statistics for the effects of Testing time, Condition, and their interaction for the fill-in-the-blank test*

Source of variance	*SS*	*df*	*MS*	*F*	*p*	*partial* η^2
within group						
Testing time	5990.077	2	2995.038	154.240	.000**	.790
Testing time*Condition	35.100	2	17.550	0.904	.409	.022
error	1592.280	82	19.418			
between group						
Condition	.372	1	.372	0.014	.908	.000
error	1122.620	41	27.381			

**p < .01

4. Results

4.1 Results of the Fill-in-the-Blank Test

A mixed-design repeated measures ANOVA was carried out in order to examine differences in Japanese students' learning of the productive skills of the target form under the conditions with or without AIE (Research question 1). The dependent variable was the mean scores of the targeted items on the fill-in-the-blank test (20 in maximum), and the independent variables were (1) Conditions with or without AIE (the experimental group vs. the control group), and (2) Testing time (pretest vs. immediate-posttest vs. delayed-posttest).

Table 1 shows descriptive statistics for the accuracy scores at the pretest, the immediate-posttest, and the delayed-posttest. The mean score at the pretest showed that there was little difference between the experimental group (M = 0.200, SD = 0.577) and the control group (M = 0.222, SD = 0.647). The mean score increased dramatically from the pretest to the immediate-posttest for both groups, yet the control group performed slightly better (M = 17.556, SD = 4.105) than the experimental group (M = 16.440, SD = 5.910). At the delayed-posttest, on the contrary, the mean score for the experimental group (M = 7.520, SD = 6.035) was slightly higher than that of the control group (M = 6.056, SD = 6.421). Yet both groups dramatically dropped scores from the immediate-posttest to the delayed-posttest (See Figure 2).

To examine whether these differences between the two groups were statistically significant, a mixed-design repeated measures ANOVA was used. As shown in Table 2, no statistically significant difference was reported on Condition ($F(1, 41) = 0.014$, $p = .908$, partial $\eta^2 = .000$) and interaction between Testing time and Condition ($F(2,82) = 0.904$, $p = .409$, partial $\eta^2 = .022$). Yet, a statistically significant difference was found for Testing time with a large effect size ($F(2,82) = 154.240$, $p < .05$, partial $\eta^2 = .790$). A post hoc least significant difference (LSD) test for Testing time confirmed that significant differences existed for all time comparisons: between the pretest and the immediate-posttest, between the immediate-posttest and the delayed-posttest, and between the pretest and the delayed-posttest. That is, the participants had significantly improved their production skills of the target form after the intervention, and they had dropped the skill after the 16 days-interval between Session 2 and Session 3. Regardless of the drops, the significant difference between the pretest and the delayed-posttest demonstrated the Japanese students' learning of the production skills after all. Nevertheless, no significant difference was reported between the two groups. This is to say, AIE did not facilitate the experimental group to develop the target form, and the participants from both groups had improved their production skills of the target form after completing the treatment session in general.

4.2 Results of the Aural GJT

The effect of AIE on the developments of receptive skills of the target form was analyzed by comparing the experimental and control groups' test scores of the aural GJT (Research question 2). Another mixed-design repeated measures ANOVA was carried out with the mean scores of the targeted items on the GJT as a dependent variable, and Conditions and Testing time as independent variables. Table 3 illustrates the descriptive statistics for the accuracy scores of the aural GJT with respect to the pretest, the immediate-posttest, and the delayed-posttest. As shown in Table 3 and Figure 3, while the experimental group outperformed the control group throughout all three tests, the transition from the pretest to the immediate-posttest, and the immediate-posttest to the delayed-posttest seemed parallel.

Subsequently, an analysis of covariance (ANCOVA) was carried out to find whether these differences were statistically significant. ANCOVA was utilized instead of the ANOVA because the analysis using ANOVA had indicated that there was a significant difference between the experimental and control groups at the pretest, regardless of the random assignment of the participants into the two groups. Therefore, the aural GJT scores were re-analyzed using the one-way ANCOVA, by controlling for the variance in both immediate-posttest scores and the delayed-posttest scores that was explained by the pretest scores. The ANCOVA was conducted separately for the immediate-posttest and the delayed-posttest, with each test's

Table 3 *Descriptive statistics for the accuracy scores of the aural GJT*

Test time	Groups	*N*	*M*	*SD*
Pretest	Experimental	25	8.200	2.217
	Control	18	6.389	2.200
Immediate-posttest	Experimental	25	13.760	3.722
	Control	18	12.778	3.889
Delayed-posttest	Experimental	25	12.200	3.215
	Control	18	10.778	2.861

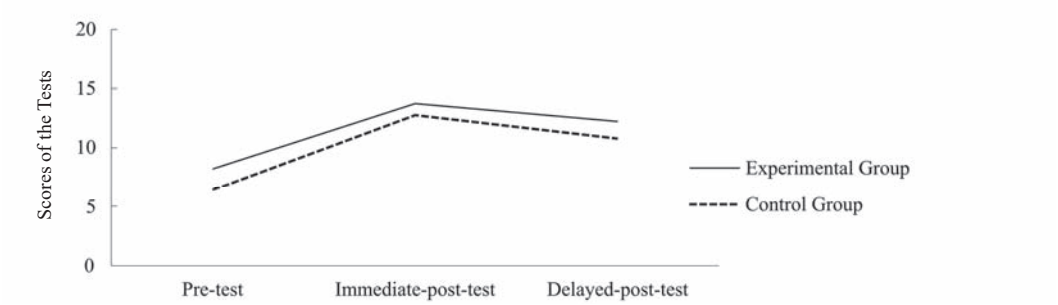

Figure 3. Changes in gained scores on the aural GJT throughout all test times.

Table 4 *One way ANCOVA for the immediate-post and delayed-post-test results of the aural GJT*

Source of variance	*SS*	*df*	*MS*	*F*	*p*
Immediate-posttest					
Pre-GJT (covariant)	19.972	1	19.972	1.402	.243
Condition	21.579	1	21.579	1.515	.226
Error	569.700	40	14.242		
Total	8262.000	43			
Delayed-posttest					
Pre-GJT (covariant)	10.362	1	10.362	1.100	.301
Condition	9.118	1	9.118	0.968	.331
Error	376.749	40			
Total	6199.000	43	11.970		

scores as a dependent variable, Condition as an independent variable, and the scores of the pretest as a covariate. As Table 4 illustrates, no significant difference was found with regard to Condition both at the immediate-posttest ($F(1,40) = 1.515$, $p = .226$) and the delayed-posttest ($F(1,40) = 0.968$, $p = .331$). That is, no statistically significant difference between the experimental and control groups was found at either immediate learning or retention of the receptive skills. These results imply

Table 5 *Descriptive statistics for the accuracy scores of the comprehension test*

Groups	*N*	*M*	*SD*
Experimental	25	4.440	0.768
Control	18	4.444	0.922

Table 6 *Statistics for the effects of Condition and Comprehension of the meaning*

	t	*df*	Sig. (2-tailed)	Mean difference	95% Confidence Interval of the Difference	
					Lower	Upper
Comprehension	-0.017	41	.986	-0.004	-0.526	0.517

that AIE did not play a facilitative role for the development of the receptive skills of the target form.

4.3 Results of the Comprehension Test

The results of the comprehension test were analyzed using an independent *t*-test to illustrate how AIE had influenced in the students' meaning comprehension (Research question 3). Table 5 shows the descriptive statistics for the comprehension test. The mean score was 4.440 (*SD* = 0.768) for the experimental group and 4.444 (*SD* = 0.922) for the control group, and there was little difference between the two groups at the comprehension test scores. The independent *t*-test demonstrated that there was no statistically significant difference between the two groups ($t(41) = -0.017$, $p = .986$) (See Table 6). This result implies that the AIE did not distract the participants in the experimental group from comprehending the meaning of the dialogue, and there was no detrimental effect on meaning comprehension by the AIE.

5. Discussion

The present study aimed to investigate whether input enhancement added to aural input contributes Japanese junior high school EFL learners to develop a newly introduced form. The analyses of the fill-in-the-blank test and the aural GJT suggest that there was no effect of AIE on participants' immediate learning and retention of the production and receptive skills of the target form. In addition, the analysis of the multiple-choice comprehension test showed no significant difference between the two groups, suggesting that there was no detrimental effect of AIE on meaning comprehension. In the following sections, some possible reasons for the findings and implications will be discussed.

5.1 The Level of Noticing

One possible explanation for the results on the L2 development is that majority of the experimental group students might not have been led to the state of *noticing* (Schmidt, 2010) of the enhanced target form while listening to the audio recording, thereby they did not benefit from the AIE. The answers on the questionnaire about the audio recording demonstrated that the participants had different noticing experience while receiving AIE: Some students verbalized their noticing of the target form that was aurally enhanced, whereas the

others could not relate manipulations and the target form, or did not even notice any enhancement. That is, some may have consciously attended to the target form that was aurally enhanced, whereas the others might not have consciously registered the aurally enhanced forms while listening to the dialogue. Regarding the relationship between attention and SLA, Schmidt (2010) defines noticing as "conscious registration of attended specific instances of language" (p. 275) with an ability to verbalize the subjective experience of the registration. Based on his definition of *noticing*, hence, some students can be categorized as those who reached the level of *noticing*, whereas the other students cannot. Schmidt (1995, 2010) highlights that linguistic features in input do not become intake unless they are *noticed*. Therefore, it could be hypothesized that the students who reached the level of *noticing* have in fact resulted in more learning of the target form than the other students who did not reach the level of *noticing*. Nevertheless, the present study did not separate those who *noticed* and did not *notice* to conduct statistical analyses, which may have hidden the effectiveness of AIE for L2 form learning under a certain circumstance. Therefore, future studies should categorize experimental group(s) thoroughly based on levels of noticing so as to incorporate noticing experience to test results to reveal the relationship between AIE and learning of the target form more rigorously.

5.2 Lack of Exemplars and Saliency

The small number of enhanced target exemplars provided to the participants during the treatment session may be another possible reason for the lack of significant difference between the experimental and control groups. Because the English teacher at the junior high school mentioned that the participants were not yet accustomed to listening activities which lasted for more than one minute, the length of the audio recording was limited to one-minute-and-a-half. As a result, the audio recording could include only four exemplars of the target form. Although the recording was played three times in succession to increase the number of correct exemplars, the participants were exposed to a total of only 12 correct enhanced exemplars in the study. Schmidt (1995) and Gass (1997) emphasized frequency of linguistic features in input as an important variable for increasing probability for learners to notice the features. Additionally, the types of AIE added to the audio recording may not be salient enough. Following the Cho and Reinders's (2013) claim about the possibility that adding pauses was too little salient, this study employed the combination of adding pauses and volume increases. Nevertheless, the questionnaire about AIE demonstrated that five of the 21 students did not mention anything about the AIE, suggesting that the AIE added to the audio recording may not salient enough. Hence, the lack of enhanced correct exemplars of the target form as well as the types of AIE added to the audio recording prevented some students from *noticing* the exemplars in the audio recording, and resulted in no significant difference between the experimental and control groups in this study.

5.3 Effect of AIE on Meaning Comprehension

The findings demonstrated that the experimental and control groups achieved the same level of meaning comprehension, although the experimental group additionally received AIE while listening to the dialogue. This finding is similar to a number of previous studies on input enhancement (LaBrozzi, 2014; Lee & Lee, 2015; Leow, 2001; Leow et al., 2003; Wong, 2003), but runs counter to VanPatten (1996)'s idea of trade-off relationship of attentional resources between meaning comprehension and form recognition. Regardless of the findings of the previous study, it should not be simply concluded

that AIE had no detrimental effect on meaning comprehension: Research question 3 attempted to examine whether directing attentional resources to the aurally enhanced target forms deprives learners of attentional resources to meaning comprehension and declines their meaning comprehension. To answer the question precisely, therefore, a comparison needs to be made between those who successfully attended to AIE in the experimental group and the control group students. Nevertheless, the analysis might have included the data of those who did not attend to and notice aurally enhanced target form: As mentioned in *5.1 The Level of Noticing,* the questionnaire on participants' noticing experience demonstrated that some students reported noticing of features unrelated to enhanced target form, and the others did not report any noticing experience. Therefore, future studies need to isolate those who failed to attend to AIE to provide definitive findings to the effect of AIE on meaning comprehension.

6. Conclusion

The present study investigated whether AIE plays a facilitative role for Japanese junior high school students to develop productive and receptive skills of the English present hypothetical conditional. Based on the idea that attention and noticing encourage L2 development (e.g., Schmidt's Noticing Hypothesis [1995, 2010]), it was speculated that AIE benefited students by drawing their attention and noticing on the target form in aural input, and resulted in a further processing of the target form into long-term memory. Contrary to the speculation, however, the statistical analysis revealed no significant difference in the development of either productive or receptive skills of the target form between the students who received AIE (the experimental group) and the students who did not (the control group). In addition, the analysis of the comprehension test demonstrated no detrimental effect of AIE on meaning comprehension, which is opposed to the claim of VanPatten's Input Processing Model (1996).

Nevertheless, definitive statements on the effects of AIE should not be provided because of the several methodological limitations of the present study, which were occurred mainly due to the feasibility issues surrounding collecting data as a vising researcher at a context of secondary education. First, the period of treatment session was short. Due to the junior high school's academic syllabus and schedule, only one treatment session was conducted in this study. In addition, there were some gaps between the participants' level of proficiency. Although the study attempted to reduce the effect of the level of proficiency and previous knowledge by selecting a newly introduced form as the target form, the gaps might have affected some of the findings of the study. Lastly, more careful examination of test validity was needed for the aural GJT. The tests used in this study included only 20 targeted-form questions in order for reducing cognitive burdens of the students: The English teacher suggested that it would be unfeasible for the Japanese junior high school students to keep their concentration for more than nine minutes to answer aural GJT. With these, future studies need to be conducted by solving these issues and utilizing more rigorous methodologies.

Regardless of these limitations, the findings of the present study shed light on the importance to incorporate learners' noticing experience to their test results in order to examine roles of input enhancement for L2 form development and meaning comprehension. The questionnaire on the experimental group's noticing experience suggested that students' noticing experience with the AIE varied within the experimental group. Although

researchers have debated roles of different levels of attention or noticing for L2 development (e.g., Schmidt, 1995; Tomlin & Villa, 1994), the previous input enhancement research has not included learners' noticing in their analysis (e.g., Wong, 2003) or examined learners' noticing to a limited extent, such as in a binary categories (noticed vs. not noticed) (Leow, 2001; Leow et al., 2003), leaving the relationship between levels of attention/noticing, input enhancement, and L2 development not explored thoroughly. To closely examine the roles of AIE for L2 morphosyntactic development and L2 meaning comprehension, therefore, future studies should incorporate different levels of learners' noticing experiences resulted from AIE to test results.

Appendices

Appendix A
Sample of the Fill-in-the-Blank Test

A. 次の日本文に合うように、(　　) 内の語を_____に書いてください。また、もし必要であれば語の形を変えてから書いてください。(Fill in the blank using words in parenthesis to make sentences English translation of the Japanese sentences provided. Conjugate verbs and/or auxiliary verbs if you feel to do so.)

- 例題 - (Example)

トムは家で夕飯を食べる時、テレビを見ます。(eat / watch)

When Tom ___eats___ dinner at home, he ___watches___ TV

問題数は１５問で、回答時間は５分です。問題が２ページにわたって記載されていますので、２ページ目の問題も忘れず解いてください。また、制限時間内であれば、解き終わった問題を見直したり、戻って解き直しても構いません。(There will be 15 questions in the test. You have five minutes to answer the test. Questions are listed on two pages. DO NOT forget to answer questions on the second page. You can go back to the questions if it is within the time limit.)

1. もしポールが運転免許を持っていたら、もっと良い仕事をもらえるのに。(have / may get)
   If Paul _____ a driver's license, he _____ _____ a better job.

2. エマは新聞を毎朝読む。(read)
   Emma _____ newspaper every morning.

3. もしアメリカに住んでいたら、英語を流ちょうに話すことができただろうに。(live / can speak)
   If I _____ in America, I _____ _____ English fluently.

Appendix B
Sample of the Grammaticality Judgment Test

B. これから、内容が異なる 30 の短い英文が放送されます。英文の中には、文法的に正しいものと、間違っているものがあります。それぞれの 動詞の形 に注目して、流れてくる一文が文法的に正しければ「正しい」に、間違っていれば「間違っている」にチェックをいれてください。英文は二度放送され、回答時間はそれぞれ 4 秒です。(30 short sentences will be played. Among the sentences, some are grammatical and others are ungrammatical. Focus on verb forms and write a checkmark either "Correct" or "Wrong" based on your grammaticality judgement for the verb forms. Each sentence will be played twice, and you have four seconds to answer questions.)

- 例題 - (Examples)

正しい(Correct) _____ 間違っている(Wrong) _____

正しい(Correct) _____ 間違っている(Wrong) _____

1. 正しい(Correct) _____ 間違っている(Wrong) _____

2. 正しい(Correct) _____ 間違っている(Wrong) _____

3. 正しい(Correct) _____ 間違っている(Wrong) _____

Appendix C
Sample of the Comprehension Test

C. これからポールとエマの少し長めの会話を続けて 3 度放送します。続いて、放送された会話に関する問題に答えてもらいます。下の解答例にあるように、質問の答えとしてそれぞれ最も正しい番号を選び、右下の_____に書いてください。(A dialogue between Paul and Emma will be played three times in succession. After listening the dialogue, answer comprehension questions regarding the dialogue. Following the example below, write the number of choices you think is correct for each question on _____.)

- 解答例 - (Example)

例題. トムは日曜日どこに行きましたか。
(Example question: Where did Tom go last Sunday?)

1. 学校 (School)
2. 図書館 (Library)
3. 動物園 (Zoo)
4. 病院 (Hospital)

2

問題は 5 問で、回答時間はそれぞれ 10 秒です。放送の間、次のページにあるスペースを使用してメモを取っても構いません。また、指示があるまで次の問題に進んだり、前のページに戻ったりしないでください。(There are five questions, and you have 10 seconds to answer each question. You can take notes while listening to the dialogue on next page. DO NOT go to another page unless you are instructed to do so.)

Q1. もしジェシカが花をプレゼントとして受け取ったら、ジェシカはどう思うとポールは考えましたか？(Q1. What did Paul think Jessica would feel if she got flowers from him as a birthday gift?)

1. 驚く (Be surprised)
2. 喜ばない (Not be happy)
3. 怒る (Get angry)
4. 喜ぶ (Be happy)

_____

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